



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/613,891	07/02/2003	Varadarajan Srinivasan	NLMI.P194	6901
25670	7590	10/04/2007		
WILLIAM L. PARADICE, III			EXAMINER	
4880 STEVENS CREEK BOULEVARD			LEE, BETTY E	
SUITE 201			ART UNIT	PAPER NUMBER
SAN JOSE, CA 95129			2616	
			MAIL DATE	DELIVERY MODE
			10/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/613,891	SRINIVASAN ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Betty Lee	2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 19 July 2007.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-26 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 02 July 2003 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                    | Paper No(s)/Mail Date. _____ .                                    |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
|   | 6) <input type="checkbox"/> Other: _____ .                        |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 2, 5, 7, 8, and 10-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amou et al. (US 6,895,012) in view of Onvural et al. (US 2002/0150115).

**Regarding claim 1,** Onvural teaches a departure time calculator for generating a departure time for each packet (see paragraph 27 lines 1-4); and a token generator for generating a token for each packet (see paragraph 24 lines 16-17). Onvural teaches all the subject matter of the claimed invention with the exception of a departure time prioritizer for comparing the departure times with each other to determine which of the departure times is the earliest.

However, Amou teaches a departure time prioritizer (see Fig. 2 Box 3) for comparing the departure times with each other to determine which of the departure times is the earliest (see col. 4 lines 61-64). Thus, it would have been obvious to one of ordinary skill in the art to use the system of Amou in the system of Onvural. The motivation for doing so is to make the system more efficient.

**Regarding claim 2,** Onvural further teaches the departure time calculator and the departure time prioritizer comprise a packet scheduler (see paragraph 24 lines 1-2 and paragraph 27 lines 1-4; Assigning timestamps to determine when the packets should be transmitted is scheduling the packet transmissions. The sorter schedules the packets by earliest deadline first.).

**Regarding claim 5,** Onvural further teaches a table having a plurality of rows, each for storing the departure time for a corresponding packet (see paragraph 24 lines 12-16); and compare logic having a plurality of outputs coupled to corresponding inputs

of the token generator (see paragraph 24 lines 16-17; The token is used to locate the data in the memory. This is what the index is used for in the invention of Onvural.).

**Regarding claim 7,** Onvural further teaches each token comprises a next free address in the table (see paragraph 38 lines 1-3; Since the index can be implemented as a linked list, the index pointer indicates the free addresses in the table by showing which slots contain a packet.).

**Regarding claim 8,** Onvural further teaches the tokens further comprise addresses for a memory that stores a payload for each corresponding packet (see paragraph 24 lines 16-17).

**Regarding claim 10,** Onvural further teaches each row of the table includes a valid bit indicating whether a valid departure time is stored in the row (see paragraph 38 lines 1-3).

**Regarding claim 11,** Onvural further teaches the tokens are generated in response to the valid bits (see paragraph 39 lines 1-9).

**Regarding claim 12,** Onvural further teaches a table having a plurality of rows, each row for storing a departure time for a corresponding packet (see paragraph 27 lines 1-4); a compare circuit having a plurality of inputs coupled to corresponding rows of the table, the compare circuit operable to compare the departure times stored in the table to determine which row stores the earliest departure time (see paragraph 24 lines 1-2); and a priority encoder having inputs coupled to corresponding outputs of the compare circuit (see paragraph 34 lines 10-12; The sorter is the compare circuit.).

Onvural teaches all the subject matter of the claimed invention with the exception of

comparing the departure times stored with each other to determine the earliest departure time.

However, Amou teaches comparing the departure times with each other to determine the earliest departure time (see col. 4 lines 61-64). Thus, it would have been obvious to one of ordinary skill in the art to use the system of Amou in the system of Onvural. The motivation for doing so is to make the system more efficient.

**Regarding claim 13,** Onvural further teaches the compare circuit asserts a select signal corresponding to the row in the table that stores the earliest departure time (see paragraph 35 lines 1-5; The sorter/compare circuit uses a pointer to determine the earliest time.).

**Regarding claim 14,** Onvural further teaches an index of the earliest departure time in response to the asserted select signal (see paragraph 24 lines 16-17).

**Regarding claim 15,** Onvural further teaches the index comprises a token that identifies the packet corresponding to the earliest departure time (see paragraph 24 lines 16-17).

**Regarding claim 16,** Onvural further teaches each row of the table includes a valid bit indicating whether the row stores a valid departure time (see paragraph 38 lines 1-3).

**Regarding claim 17,** Onvural further teaches a next free address in the table in response to the valid bits, the next free address comprising a token that identifies a corresponding packet (see paragraph 24 lines 16-17 and paragraph 38 lines 1-3; Since

the index can be implemented as a linked list, the index pointer indicates the free addresses in the table by showing which slots contain a packet.).

**Regarding claim 18,** Onvural further teaches a departure time calculator coupled to the table (see paragraph 27 lines 1-4).

**Regarding claim 19,** Onvural teaches a departure time calculator for calculating a departure time for each packet (see paragraph 27 lines 1-4); a table including a plurality of rows, each for storing the departure time for a corresponding packet (see paragraph 24 lines 12-16); a compare circuit having inputs coupled to the rows of the table, the compare circuit for comparing the departure times stored in the table to select the row that contains the earliest departure time (see paragraph 24 lines 1-2); and a priority encoder having a plurality of inputs coupled to corresponding rows of the table, the priority encoder for generating an address of the selected row (see paragraph 34 lines 10-12; The sorter is the compare circuit. The index is the address used for the row.). Onvural teaches all the subject matter of the claimed invention with the exception of comparing the departure times stored with each other to determine the earliest departure time.

However, Amou teaches comparing the departure times with each other to determine the earliest departure time (see col. 4 lines 61-64). Thus, it would have been obvious to one of ordinary skill in the art to use the system of Amou in the system of Onvural. The motivation for doing so is to make the system more efficient.

**Regarding claim 20,** Onvural further teaches a plurality of valid bits, each indicating whether valid data is stored in a corresponding row of the table, where the

priority encoder generates a next free address for the table in response to the valid bits (see paragraph 24 lines 16-17 and paragraph 38 lines 1-3; Since the index can be implemented as a linked list, the index pointer indicates the free addresses in the table by showing which slots contain a packet.).

**Regarding claim 21,** Onvural teaches calculating a departure time for each packet (see paragraph 27 lines 1-4); comparing the departure times to determine which departure time is the earliest (see paragraph 24 lines 1-2); and transmitting the packet corresponding to the earliest departure time (see paragraph 24 lines 1-2). Onvural teaches all the subject matter of the claimed invention with the exception of comparing the departure times stored with each other to determine the earliest departure time.

However, Amou teaches comparing the departure times with each other to determine the earliest departure time (see col. 4 lines 61-64). Thus, it would have been obvious to one of ordinary skill in the art to use the system of Amou in the system of Onvural. The motivation for doing so is to make the system more efficient.

**Regarding claim 22,** Onvural further teaches generating a token for each packet (see paragraph 24 lines 16-17; The index is used as the token.); and storing each packet's departure time at a location in a table addressed by the packet's token (see paragraph 38 lines 1-8; The index addresses a location in the table.).

**Regarding claim 23,** Onvural further teaches storing a payload for each packet at a location in a packet memory addressed by the packet's token (see paragraph 24 lines 16-17; The index is used to locate the packet within the memory.).

**Regarding claim 24,** Onvural teaches generating a token for each packet (see paragraph 24 lines 16-17; The index is used as the token.); calculating a departure time for each packet (see paragraph 27 lines 1-4); storing the departure times in rows of a table addressed by the tokens (see paragraph 38 lines 1-8; The index addresses a location in the table.); comparing the departure times to determine which departure time is the earliest (see paragraph 24 lines 1-2); identifying the packet corresponding to the earliest departure time; and transmitting the identified packet (see paragraph 24 lines 1-2). Onvural teaches all the subject matter of the claimed invention with the exception of comparing the departure times stored with each other to determine the earliest departure time.

However, Amou teaches comparing the departure times with each other to determine the earliest departure time (see col. 4 lines 61-64). Thus, it would have been obvious to one of ordinary skill in the art to use the system of Amou in the system of Onvural. The motivation for doing so is to make the system more efficient.

**Regarding claim 25,** Onvural further teaches asserting a signal line for the row of the table that contains the earliest departure time (see paragraph 35 lines 1-5; The sorter/compare circuit uses a pointer to determine the earliest time.); generating an index of the row having the asserted signal line (see paragraph 24 lines 16-17); and reading a packet from a location in a packet memory addressed by the index (see paragraph 24 lines 16-17).

**Regarding claim 26,** Onvural further teaches generating a next free address for the table (see paragraph 38 lines 1-3; Since the index can be implemented as a linked

list, the index pointer indicates the free addresses in the table by showing which slots contain a packet.).

5. **Claims 3 and 4** are rejected under 35 U.S.C. 103(a) as being unpatentable over Amou et al. (US 6,895,012) in view of Onvural et al. (US 2002/0150115) as applied to claim 1 above, and further in view of Lynn et al. (*The Priority Token Bank in a Network of Queues*).

**Regarding claim 3,** Onvural in view of Amou teaches all the subject matter of the claimed invention with the exception of the token generator comprising a priority encoder. Lynn teaches the token generator comprising a priority encoder (see Section 3, pg. 1388 paragraph 4 lines 1-4). Thus, it would have been obvious to one of ordinary skill in the art to use the system of Lynn in the system of Onvural in view of Amou. The motivation for using the priority token bank as taught by Lynn in the system of Onvural in view of Amou is that that priority token bank would be able to guarantee a certain quality of service.

**Regarding claim 4,** Onvural in view of Amou teaches the departure time prioritizer comprises a programmable priority encoder (see paragraph 34 lines 10-12; The priority encoder is programmed to assign priorities based on QoS requirements.). Onvural in view of Amou teaches all the subject matter of the claimed invention with the exception of the token generator comprising a programmable priority encoder.

Lynn teaches the token generator comprising a programmable priority encoder (see Section 3, pg. 1388 paragraph 4 lines 1-4; The priority encoder is programmed to

Art Unit: 2616

assign priorities based on QoS requirements.). Thus, it would have been obvious to one of ordinary skill in the art to use the system of Lynn in the system of Onvural in view of Amou. The motivation for using the priority token bank as taught by Lynn in the system of Onvural in view of Amou is that that priority token bank would be able to guarantee a certain quality of service.

6. Claims 6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amou et al. (US 6,895,012) in view of Onvural et al. (US 2002/0150115) as applied to claim 1 above, and further in view of McAlpine (US 6,011,798).

**Regarding claim 6,** Onvural in view of Amou teaches all the subject matter of the claimed invention with the exception of more than one row of the table stores the same departure time. Mcalpine teaches more than one row of the table stores the same departure time (see col. 5 lines 27-32). Thus, it would have been obvious to one of ordinary skill in the to use the system of McAlpine in the system of Onvural in view of Amou. The motivation for using the system of McAlpine in the system of Onvural in view of Amou is so that the system will be able to transmit more than one packet with the same scheduled time.

**Regarding claim 9,** Onvural in view of Amou teaches all the subject matter of the claimed invention with the exception of the departure times can be stored in any order in the table, regardless of priority. McAlpine teaches that the departure times can be stored in any order in the table, regardless of priority (see col. 5 lines 11-15). Thus, it would have been obvious to one of ordinary skill in the art to use the system of

Art Unit: 2616

McAlpine in the system of Onvural in view of Amou. The motivation for using the system of McAlpine in the system of Onvural in view of Amou is so that the packets do not have to be sorted before placing them in the table, which simplifies the process.

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Morris et al. (US 6,477,144), Kawasaki et al. (US 2001/0014081), and Witchey (US 5,563,885) are all cited to show systems which are considered pertinent to the claimed invention.
  
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Betty Lee whose telephone number is (571) 270-1412. The examiner can normally be reached on Monday-Thursday 9-5 EST and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on (571) 272-3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BL

Betty L



HASSAN KIZOU  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600